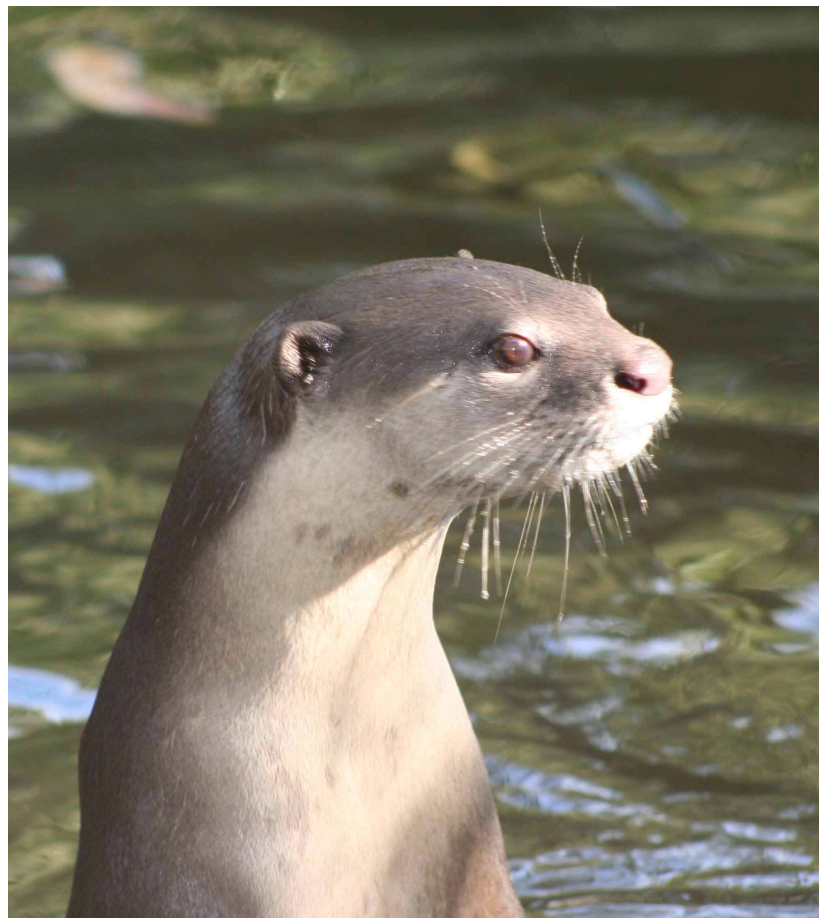


Minimum Husbandry Guidelines for Smooth-Coated Otters in Captivity.

IUCN/SSC Otter Specialist Group Otters in Captivity Task Force

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Photograph taken at the Phnom Tamau Wildlife Rescue Centre by Annette Olsson

I Introduction and Objective

This manual has been collated by an international body of experts to help institutions and individuals recognize and adhere to the basic minimum standard of care required in keeping smooth-coated otters (*Lutrogale perspicillata*). This species is referred to as the smooth otter in North America.

II Natural History

There are currently thirteen species within the Mustelidea, found throughout Europe, the Americas, Asia and Africa. The smooth-coated otter is one of the five species inhabiting Asia; its range extending from Bangladesh, Bhutan, and Nepal across to Malaysia, Indonesia, Southern China and Southern India. This otter is found in a wide range of habitats from tropical coasts to mountain rivers, but being strong swimmers, they prefer to live alongside large, well-forested rivers, lakes and reservoirs.

The IUCN rates it as 'Vulnerable' - facing a high risk of extinction in the wild, following a 50% reduction in population over the last ten years, as a result of a loss of habitat and direct exploitation

III Social Groupings

Smooth-coated otters live in family groups, and if a territory is rich enough in food, several families will share a territory. These territories are necessarily large as these are big otters requiring a lot of food. A family will consist of an alpha male and female with cubs of several generations, and occasionally other adults; the groups do not build up to the large numbers seen in *Aonyx cinereus* – adult females leave to found their own groups. In captivity, in a large enough enclosure, a male has cohabited successfully with several adult females, but the pen must be designed so that in the event of aggression, the animals can always escape from each other.

IV Feeding Habits

The Smooth-Coated Otter is a carnivore and in the wild its diet is more than 90% fish over 15cm long, mainly slow-moving fish such as catfish; the balance is frogs, birds, turtles, water snakes, crabs and water rats. The metabolic rate is high, and these active otters will consume 20% of their bodyweight a day. In the wild, they will have several hunting sessions throughout the 24-hour period, interspersed with rest periods.

In captivity, these otters should be fed at least three times per day, with one or two additional enrichment feeds (i.e. scattered treats or live foods that require the animals to work for their meal). Note that in some countries, such as the United Kingdom, it is illegal to feed live vertebrates to carnivores.

We recommend the following diet for this species, but note that it is important to take into consideration individual animal's likes and dislikes. The following is a suggested diet which will ensure the otter is well nourished and healthy.

Smooth-Coated Otter Diet–

The list below includes possible foods and portion sizes acceptable to this otter species.

- **90% of the diet should be fish** – fresh if possible, fed whole to adults, and in chunks with bones removed for young otters. If frozen fish is used, a supplement of vitamin E should be added. If carp is fed in a high proportion, a vitamin B supplement is needed.
- Day old chicks 2 per day (some institutions remove the yolk sac due to salmonella concerns).
- A small amount of meat - this should be of good quality and can consist of, non-fat beef including ox heart, chicken, horse, venison. Tripe is an easily digested protein, which is rich in vitamins and useful for sick or weak animals. Alternatively, dry food concentrate such as “lams cat food” .
- Potassium citrate – ¼ teaspoon per otter twice per week (thought to help prevent kidney stones)

The above foods should be divided into three meals per day.

Feeding times should be varied somewhat to prevent habituation of the otters to specific feeding times. This habituation leads rapidly to stereotypic behavior and begging as the animals anticipate the approach of meal time. If this is not possible due to keeper time constraints, it is then important to always feed at the specified time to prevent otter stress and anxiety.

Scatter Feeding - these foods can be used as enrichment throughout the day.

Mealworms, snails, earthworms, crickets, crayfish, molluscs, shell fish, grapes, raisins, apples. Raw or soft boiled eggs can be used as a treat or a medium for medicating an otter. The food should be hidden around the enclosure under rocks, in tree trunks etc to encourage the otters to forage and be active. This natural behaviour makes very enjoyable viewing for the visitors. This should be done at least twice a day with the time varied daily to prevent habituation.

Fresh drinking water at all times away from their swimming water. The bowl should be disinfected every day, shaped so the otter cannot overturn it and not too large so the otter tries to use it as a bath or toilet.

Quantities of Food.

As a guide line a fit, healthy otter would need approximately 1000g of food in total per day. This can be variable depending on the following -

Factors affecting food quantities

- Age – younger otters (up to a year old) need more food than older otters
- Sex - some male otters are often slightly larger and require more food
- Pregnancy/lactation - pregnant and lactating females need as much food as they can eat at least 20% more than normal.
- Temperature – environmental and seasonal changes will affect the quantity each otter requires.
- Health - if the otter is unwell it may need more frequent, smaller meals per day. Consider feeding tripe.

Number of Feeds

Most institutions feed their otters 3 times per day, generally early morning, mid-day, and late afternoon/early evening. A minimum of three feeds is recommended (e.g. 1000g / 3 meals = 350g per animal per feeding).

Weight Reduction

Should an otter become overweight, feed lower calorie food or foods with more bulk and add more water to the diet. Reduction in quantities of food can lead to extremely aggressive behaviour.

Where to Feed

If possible feed in different places around the enclosure and in separate dishes per animal. The use of separate feeding bowls make it easier to medicate a particular animal should the need arise. It is good practice to watch the otters feed to ensure all the otters are eating a balanced diet. Often more timid otters take the fish away to eat quietly so leaving all the meat with its nutrients to be consumed by the dominant otters, hence some otters may only ever eat fish and could develop health problems. Always remove any uneaten food one hour after feeding.

V Introductions

It is possible to introduce animals to each other at all ages; it is infinitely more successful when the otters are young.

Experienced keepers will know their animal's characters and as a result may be able to pair them easily.

The ideal introduction is when the otters can be in adjacent pens without physical contact, so they can hear, see and smell each other. This might only be for a few days, it may need 2 to 3 weeks or it may never be possible.

Moving furniture and bedding between the two pens or even switching each otter into the others pen and watching the behaviour of the recipient can be useful. Any aggression suggests it is too soon to take the next step. If the otters seem amicable then where possible allow them to have contact on either side of the fencing, again, the resultant behaviour will indicate if and when they can be allowed full contact with each other.

It is important when the otters are allowed full contact there are sufficient keepers present to separate fighting otters. Once together keepers should watch the animals for as long as possible to detect any signs of animosity. If aggression is seen the animals should be separated immediately. Do not leave the otters overnight unless you are sure they are amicable. Full contact should only take place when it is quiet and there are no visitors around – not only does this mean that if there are problems they can be dealt with without the public watching but it also means there are less distractions to the animals during this process. If it is practical using CCTV to watch the otters is very useful as you can watch their behaviour without them knowing it and so you can see what they do without human presence.

If an otter is known to be very dominant it is advisable to introduce the more dominant otter into the less dominant otter's territory. If animals are being introduced and going into a new enclosure, both animals should be familiarized with the exhibit before introductions occur.

If siblings have been together for a long time it is not advisable to split them up.

On occasions where an adult male is being introduced to another otter (male or female), both animals can be given oestrogen by the vet to reduce aggressive behaviours.

Always remember some otters will never be compatible whatever you try and even established pairings can change where one otter can become an outcast or a victim.

VI Housing and Enclosures.

Land

Although otters enjoy and spend a lot of time in water they also require plenty of dry land for resting, grooming, digging and foraging. The more natural the surroundings the better so a substrate of grass, soil, pebbles, non abrasive sand (NOT sharp sand), mulch as opposed to concrete will be beneficial to the otter group. Concrete walking areas can cause foot and tail sores. Hollow logs, natural trees and plants, such as bamboo and grasses, create a more interesting habitat. Try to provide a higher viewing platform which the otters can easily climb ensuring this is at least a metre away from the peripheral fence. Some vegetation could be strategically placed to allow the otter privacy from the viewing public. Otters should always have free access to their nest boxes. The site of the enclosure must be away from loud, frightening sounds.

This large, active species is particularly hard on their enclosure with much digging (good) and tearing up of vegetation, so they should also have hollow logs, and large objects to climb on that they cannot destroy.

They must be able to rub themselves completely dry. A heat lamp above a rubbing place, inside or out will help with this.

In order to breed successfully, smooth-coated otters seem to need to be able to dig their own burrows. In order to do this safely, it is recommended that an earth mound or bank is made out of material which the otters can safely burrow into without danger of tunnels collapsing (otters have been killed due to burrow collapse).

The recommended ratio is 20% water to 80% land.

Water

Smooth-coated otters are large animals that like to swim. The pond should be shallow at one end, with a gently sloping bank so that if cubs fall into the water, they can get out. The other end should be deep enough to let the animals have good exercise. It should be surrounded by absorbent sand (not sharp sand) so the otters can dry their coats.

If the pond is artificial and not filtrated it must be cleaned weekly. Fresh drinking water must be supplied for each day in a clean, non- spillable, disinfected container. The warmer the water the more these tropical otters swim. An ideal temperature is about 80 to 85° F (26.6 – 29.4° C). Pools can be constructed of many different materials such as plastic liners, concrete, gunnite or a natural pool dug out to the appropriate depth. When there are young cubs in the group the water level should be no more than 10cms and a plank or well placed stones will help a cub climb out if necessary.

Barriers

To contain the otter either 1.5m fence with an inner overhang of 30cm or a non climbable wall is recommended. The wall or fence should be buried in the ground to a depth of at least 80cm and slightly angle inward to discourage the otter from digging out. As a last resort hot wires can be used but these must be placed far away so there can be no contact with an otter in the water.

The perimeter fence must be checked daily. Ensure trees are not overhanging the fence and providing a means of escape for these able climbers. It is advisable to have a double door entry system with an air lock so no animals can escape as the keeper enters or exits the enclosure.

Glass viewing panels are very effective in a wall or fence.

Nest Boxes

More than one nest box should be provided and situated away from sun, rain, wind etc. Otters may choose not to use them, but they should still be supplied. Boxes should be made from wood. The tunnel leading into the nest box should have a turn in it to protect the otter from draughts or alternatively, inside the nest box should be a second box with its entrance away from the external opening. Each nest box must have ventilation holes and it is possible to have

a plastic/perspex side to the box so visitors can watch the activity inside the box. Ideally, if the box can be removed from its position it could be used as a carrying box when an otter has to be moved. The entrance should be able to be closed, a slider arrangement at the entrance to the tunnel and to the actual box gives the box a multipurpose value. The bedding material can be hay, grass, straw, shredded paper, wood shavings, towels, fleece or carpet. Whichever bedding is used it must be plentiful and clean. If the bedding is left outside on dry days the otters will make their own beds!

If the temperature drops below 50° F (10° C) they will need supplemental heating, either a heat lamp or a heat mat, ensuring the otter cannot reach these heat sources. Otters enjoy snow and ice provided they can get dry and warm after a play session.

Size of Enclosure

The recommended minimum size is 100m² per animal – as large an enclosure should be provided as possible. Consider the area available for the otters before encouraging a breeding programme or use contraception to limit breeding.

Like all otters, smooth-coated otters prefer and thrive on living outdoors in natural light and fresh air. DO NOT lock them out of their dens other than for cleaning purposes.

Cleaning the Enclosure.

Otters scent mark around their enclosures, and this species establishes communal latrines. Removing the latrine may cause an increase in stress to the group, so it better to leave some faeces in the pen whilst removing the bulk. When removing bedding, leave some of the cleanest part of the old bedding so the otters can recognise their own scent and know it is their bed.

Daily cleaning should include spot cleaning, raking, and fresh water in a clean container. Substrates can be renewed when necessary, and disinfecting carried out to indoor quarters, on a weekly basis. Nest boxes must be checked regularly as some otters like to defecate in the corner of the box, if this occurs on a regular basis remove the material and put it outside to encourage them to use outdoor latrines.

Otters are hard on their environment in captivity, so frequent enclosure refurbishment must be budgeted for.

VII Enrichment.

Otters are by nature active, busy and inquisitive animals and need to be kept occupied. See above for use of scatter feeding as an enrichment tool. Fish, nuts, raisins etc. can be frozen into small or large ice cubes and put in their water. Feeding balls filled with dry food, a sack of hay, and some fish bits all help to keep the otters active. Whole melons, pumpkins, and butternut squash can be put in their water but must be removed the same day. Some institutions give chicken or pheasant in feather on an occasional basis. Two hanging basket frames can be wired together and stuffed with bedding and some scatter food, if this is then

attached to a tree with a bungee the otters have to jump to catch hold of the bedding. Make sure there is no possibility of otters becoming tangled and strangled in the cords.

Extra bedding put into the enclosure far away from the nest box will keep them busy carrying the bedding back and forth. Running water is a great attraction, for example, a fountain or sprays used at random intervals.

Occasionally, moving some of the furniture to different places in the pen activates their curiosity. Hollow logs, branches, sand pit, hay pit all are alternatives for enrichment. If you have more than one group of otters swap items between the groups to stimulate patrolling and scenting. Note: if materials are swapped between groups monitor the animals for signs of stress. Also, before doing this ensure that all animals are healthy and you are not transferring potentially harmful vectors with your enrichment.

Otters can be very destructive especially with any new planting, if it is not firmly anchored in the ground they will soon use for bedding or in the pool to block up your filtration unit. Ensure all filters are carefully sited to prevent the otters damaging it or themselves.

VII Catching Up

Crate training is the best way of catching up any otter. It is the least stressful to both animal and keeper. There are several good resources on training samples of these, and a basic crate training procedure are available on the OCT website (list website address). We will put a list of resources on the web site.

Basic Approach

- Acclimate the otters to the transfer box/crate by requiring them to move through the crate on a regular basis.
- Using a different item for each animal (hand, ball on a pole, cube on a pole, etc.) train each otter to stand with its nose at the object. This is called stationing.
- Gradually station the animal in the crate.
- Acclimate the animal to having the door closed for gradually longer periods of time.

Alternatively, use the nest box. Ensure your transport box will fit exactly to the entrance of the tunnel or box (no gaps as the otter will escape). The transport box should have a slider arrangement door so once the otter is inside this can be closed. Ideally, design this slider so it can be operated from outside the pen. The otter is more likely to enter the box if it is dark so cover with a blanket if it is a wire cage. To entice the otter into the box will need patience, some otters will come to their keepers call or to food placed in the box. If the whole group is in the nest box catch and release each otter until you have the required animal in the transport box. **Keep calm**; once the otter is suspicious or stressed postpone catching until another time, but leave the transport box open in the pen with which they can become more familiar.

It is more difficult to catch an individual when a large group of animals is kept together. It is possible to use a large, soft edged catching net. The keeper must be quick and accurate to minimize the degree of stress to the group. Once the otter is in the net the other animals may become aggressive to the keeper/catcher. The keeper should be aware even small otters can bite through rubber boots and gloves.

If a grasper is used (a noose on a stick), it must be positioned behind the front legs as it will slip off otherwise and may also strangle the animal. If possible, use one of the other methods instead as this is very stressful for captive animals; the main use of graspers is with wild animals being rehabilitated as fear of man is no bad thing in that specialised case.

VIII Behavioural Problems

Otters are intelligent, active, curious creatures and an ideal day would be to be fed 3 or 4 times a day, have plenty of stimulation and activities which include playing and foraging and also have time to rest out of the public view if so desired.

What is not normal is constant begging and calling and any other form of stereotypic behaviour. Keepers should see their otters several times a day. If the otters only see their keepers at feeding times they will associate them only with food and hence even a similar shirt worn by the visiting public can trigger a begging session. Begging and calling for more than 30 minutes before food is not acceptable behaviour and the otters need stimulation to change their habits.

Once a group starts begging it is difficult to break the habit but by no means impossible and the result will benefit the otters and prevent concern for the otter's welfare amongst the visitors.

IX Breeding.

Smooth-coated otters are monogamous, with the female strongly dominant, and both parents raising the cubs – in captivity, it is possible for several females to remain in the same enclosure and mate with the same male but this will depend very much on the otters involved and how much space there is in the enclosure – a very large enclosure with many nest boxes is needed for this. It is very important that before the decision to breed has been taken, the bloodlines of the dam and sire are checked to prevent inbreeding.

The oestrus cycle lasts between 30 and 37 days, with 14 days' receptivity, and breeding can occur throughout the year. Both sexes can be sexually mature at 18 months but are more likely to breed at 2 to 3 years. Mating takes place in water after an extended and noisy play period, and shortly after mating, the female may become aggressive toward the male.

Gestation is approximately 63 days. Young females may miscarry or lose their first litter. The female generally becomes very aggressive both before and after giving birth. The male should if possible be kept with the female as he plays an active role in bringing up the cubs. Once the cubs are around 12 weeks old and are being taught to swim, the male is accepted back into

the family, and will help look after them. In captivity, the cubs seem to be allowed to eat first, and then the female; the male not only waits until the rest have finished, but in some cases, the male gives food he has been given to the female and cubs. Both parents and cubs will share the same housing. Multiple denning boxes/sites should be supplied as the pair may decide to move the whole family to another nest, or out of the burrow they have dug for no apparent reason. Ensure plenty of extra clean, dry bedding is available for the family to use at all times.

These otters can have 2 litters per year with up to 5 cubs each time (average 3). The older siblings help to bring up the younger litter. The alpha male and female remain dominant in the family group. If an older sibling shows continual aggression to the cubs, or if the parents (especially the alpha female) become aggressive toward it, remove it and start a new group with a mate, or remove two siblings together. Do not, if possible, remove offspring until they are at least one year old as they need to gain experience of helping to raise cubs.

The lactating female will require at least 20% more food.

X Orphans or Rejected Cubs.

Neonates who do not survive are put outside the nest by the parents. If very young cubs are not thriving the decision has to be made if to hand rear or not. Hand rearing is possible, it is time consuming and the resultant otter may be imprinted on humans making it difficult to return to the other otters. If the decision is made to hand rear, a substitute cat milk for kittens can be used (in some countries, specialised rearing milk may be available – one brand is Petag 30/55 Milk Matrix replacer – see <http://www.petag.com> . Other useful brands that have been used are Esbilac and Cimicat).

Cubs should be fed every three hours initially. Before feeding, gently massage the cub with your fingers to stimulate the circulation. The cub will also need massaging, very gently, around the anus to ensure defecation after feeding. At least once a day, after feeding, clean the cub with a clean cloth wrung out in warm water using soft small strokes similar to the dam licking her cub clean. During this time the cub should be housed, quietly, in a warm dark box. Offer a small, clean soft toy for company; a soft toy otter is best as the cub frequently sucks its tail for comfort. The amount to feed per episode is a matter of judgement – if the cub cries for food immediately the bottle is withdrawn, it probably needs more, but if it is not interested, it has probably had enough - it is important not to overfill a cubs stomach causing bloat. As with babies, use common sense. If the hole in the teat is not big enough, hungry cubs will suck in air as well, and must be encourage to bring it up, just like a human baby. Sometimes males will suck on their penis and this can become very sore – gently putting on some orange oil with cotton wool will stop the cub doing this. Do it before it gets sore as otherwise it will sting.

Weaning cubs is done by adding fish soup (see below) to the bottle, and gradually increasing the proportion of fish. Small pieces of boneless, scaleless fish can then be offered, increasing in size as the cub grows and can cope. Weaning can be started at around six to seven weeks.

Supplementary Feeding. At weaning some of the smaller cubs are not ready to take solids but the dam may no longer allow them to feed from her. All cubs should be closely monitored because smaller ones may exhibit a failure to thrive at this time. If the keepers have a good relationship with the family group especially the parents, it is possible to help these cubs, without removing them from the family. An extra feed of “fish soup” can be offered through a syringe and fed to the youngsters whilst remaining in their enclosure.

Fish soup is made up of kitten milk, reconstituted as directed on the container, small amounts of chopped fish and calcium supplement and a general vitamin supplement, this is liquidized to a smooth consistency and put into a syringe with a soft flexible tube (no more than 2cms long) attached. The thickness of the soup is determined by the amount of fish used. A cub may take as much as 30mls of soup at one feed and can be fed up to 3 extra feeds per day. The proportion of fish to milk can be increased as the cub grows.

Separate the cub from the family, usually by keeping the cub in the nest box and pushing the rest of the family out and then persuade it to drink from the syringe. The cub quickly gets used to this regime and it has been found that the cub will eventually come to the fence to be fed from the outside until it is old enough to feed itself. This can help to resolve the problem of imprinting and lone otters.

Cub Development

This is an average! Individual cubs will vary.

Eyes open:	10 days
Swimming lessons:	12 weeks
First solids:	around 8 weeks
Weaned:	10 weeks

Cubs can be microchipped at 6 weeks of age. Microchipping is strongly recommended to ensure the otter’s identity throughout its life regardless of any changes of institution.